

CLAIMS

1. A method for determining homogenization and/or reaction completion, comprising the steps of:

(1) mixing a test liquid and a reagent liquid to obtain a liquid mixture;

(2) measuring an optical property of said liquid mixture after the mixing continuously or a plurality of times discretely;

(3) obtaining a relation between the measured value of the optical property obtained and the elapsed period of time since the start of the measurement after the mixing; and

(4) determining, on the basis of said relation, whether said test liquid and said reagent liquid have been substantially homogeneously mixed with each other and/or a reaction between said test liquid and said reagent liquid has been substantially completed.

2. The method for determining homogenization and/or reaction completion in accordance with claim 1, wherein

said step (3) is a step of obtaining dS_1/dt (wherein S_1 is the measured value of the optical property obtained and T is the elapsed period of time since the start of the measurement after the mixing), and

said step (4) is a step of determining that said test liquid and said reagent liquid have been substantially homogeneously mixed with each other and/or the reaction

between said test liquid and said reagent liquid has been substantially completed, when the dS_1/dt has continuously been in a predetermined range R_1 for a predetermined period of time T_1 or longer.

3. The method for determining homogenization and/or reaction completion in accordance with claim 1, wherein

said step (3) is a step of obtaining $(dS_1/dt)/S_1$ (wherein S_1 is the measured value of the optical property obtained and T is the elapsed period of time since the start of the measurement after the mixing), and

said step (4) is a step of determining that said test liquid and said reagent liquid have been substantially homogeneously mixed with each other and/or the reaction between said test liquid and said reagent liquid has been substantially completed, when the $(dS_1/dt)/S_1$ has continuously been in a predetermined range R_2 for a predetermined period of time T_2 or longer.

4. The method for determining homogenization and/or reaction completion in accordance with claim 1, wherein a measurement is rendered invalid when homogenization and/or reaction completion has not been determined within a predetermined period of time T from the start of the measurement.

5. A method for determining homogenization and/or reaction completion, comprising the steps of:

(1) mixing a test liquid and a reagent liquid to

obtain a liquid mixture;

(2) measuring an optical property of said test liquid and said liquid mixture continuously, or, measuring an optical property of said test liquid at least once and measuring an optical property of said liquid mixture after the mixing a plurality of times discretely;

(3) obtaining a relation between the measured value of the optical property obtained and the elapsed period of time since the start of the measurement after the mixing; and

(4) determining, on the basis of said relation, whether said test liquid and said reagent liquid have been substantially homogeneously mixed with each other and/or the reaction between said test liquid and said reagent liquid has been substantially completed.

6. The method for determining homogenization and/or reaction completion in accordance with claim 5, wherein

said step (3) is a step of obtaining $(dS_1/dt)/(S_1 - S_0)$ (wherein S_0 is the measured value of the optical property of said test liquid, S_1 is the measured value of the optical property of said liquid mixture, and T is the elapsed period of time since the start of the measurement after the mixing), and

said step (4) is a step of determining that said test liquid and said reagent liquid have been substantially homogeneously mixed with each other and/or the reaction between said test liquid and said reagent liquid has been

substantially completed, when the $(dS_1/dt)/(S_1-S_0)$ has continuously been in a predetermined range R3 for a predetermined period of time T3 or longer.

7. The method for determining homogenization and/or reaction completion in accordance with claim 5, wherein a measurement is rendered invalid when homogenization and/or reaction completion has not been determined within a predetermined period of time T from the start of the measurement.

8. A method for measuring solution concentration, comprising the steps of:

(1) mixing a test liquid and a reagent liquid to obtain a liquid mixture;

(2) measuring an optical property of the liquid mixture after the mixing continuously or a plurality of times discretely;

(3) obtaining a relation between the measured value of the optical property obtained and the elapsed period of time since the start of the measurement after the mixing;

(4) determining, on the basis of said relation, whether said test liquid and said reagent liquid have been substantially homogeneously mixed with each other and/or a reaction between said test liquid and said reagent liquid has been substantially completed; and

(5) determining the concentration of a specific component of said test liquid based on said measured value.

9. The method for measuring solution concentration in accordance with claim 8, further comprising the step of mixing another reagent liquid with said test liquid, after determining that the said test liquid and said reagent liquid have been homogeneously mixed and/or the reaction therebetween has been substantially completed.

10. The method for measuring solution concentration in accordance with claim 9, wherein another reagent liquid is mixed with said test liquid upon the lapse of a predetermined period of time T_4 after determining that the said test liquid and said reagent liquid have been homogeneously mixed and/or the reaction therebetween has been substantially completed, and the optical property of said liquid mixture is measured prior to the lapse of the predetermined period of time T_4 .

11. The method for measuring solution concentration in accordance with claim 8, wherein a measurement is rendered invalid when homogenization and/or reaction completion has not been determined within a predetermined period of time T from the start of the measurement.

12. A method for measuring solution concentration, comprising the steps of:

(1) mixing a test liquid and a reagent liquid to obtain a liquid mixture;

(2) measuring an optical property of said test liquid and said liquid mixture continuously, or, measuring an optical property of said test liquid at least once and

measuring an optical property of said liquid mixture after the mixing a plurality of times discretely;

(3) obtaining a relation between the measured value of the optical property obtained and the elapsed period of time since the start of the measurement after the mixing;

(4) determining, on the basis of said relation, whether said test liquid and said reagent liquid have been substantially homogeneously mixed with each other and/or a reaction between said test liquid and said reagent liquid has been substantially completed; and

(5) determining the concentration of a specific component of said test liquid based on said measured value.

13. The method for measuring solution concentration in accordance with claim 12, further comprising the step of mixing another reagent liquid with said test liquid, after determining that the said test liquid and said reagent liquid have been homogeneously mixed and/or the reaction therebetween has been substantially completed.

14. The method for measuring solution concentration in accordance with claim 13, wherein another reagent liquid is mixed with said test liquid upon the lapse of a predetermined period of time T_4 after determining that the said test liquid and said reagent liquid have been homogeneously mixed and/or the reaction therebetween has been substantially completed, and the optical property of said liquid mixture is measured prior to the lapse of the predetermined period of time T_4 .

15. The method for measuring solution concentration in accordance with claim 12, wherein a measurement is rendered invalid when homogenization and/or reaction completion has not been determined within a predetermined period of time T from the start of the measurement.